TERRAMODEL NOTE 11
Drafting Tips

Objective--

The objective of this TM Note is to describe drafting tips that can be used to produce a more professional drawing.

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TERRAMODEL Note 11—Drafting Tips

The following list of Drafting Tips have been written to help the user produce quality drawings:

1.   Choosing the correct text size

      1A.   Entering text in sheet view
      1B.   Entering text in plan or profile view
      1B-1. Table method for text selection
      1B-2. Changing plot scale method for text selection -
                  PREFERRED METHOD!!!

2.   Editing text

3.   Adding additional contour labels

4.   Changing linetype scales

5.   Changing arrowhead sizes

6.   Suggestions on plotting design surfaces

Begin this tutorial with a surface model that has been developed in Terramodel. If you do not have a current project, use the file Tmnote11 as an example.

[File] – [Open…]

File name: **Tmnote11.pro**

[Open]

1.   CHOOSING THE CORRECT TEXT SIZE

In Terramodel, one of the difficulties is to have consistent text size when different dynaviews are imported into a drawing in sheet view.

NRCS Technical Release No. 73 – Computer Aided Design and Drafting (CADD) Standards shows a minimum text height of 0.06" for general text and 0.09" for titles when the drawings will not be reduced. Therefore, when working on an 8.5" x 11" (A-size) or 11" x 17" (B-size) sheet, the recommended text size is **0.06"** and **0.09"** for titles. It is recommended that 22" x 34" (D-size) drawings use **0.12"** for general text and **0.18"** for titles since this size of drawing is often reduced to half size (11" x 17") drawings.

The suggested minimum text size for contour labels is **0.04"** for 8.5" x 11" or 11" x 17" sheets or **0.08"** for 22" x 34" sheets. This does not satisfy the TR-73 minimums but is legible and may be more suitable for crowded contour lines.

1A.   ENTERING TEXT IN SHEET VIEW

The scale of sheet view is 1" = 1". Therefore, use the text size desired.

For example, if a text size of 0.12" is used with the **T**ext command in sheet view, and the sheet is plotted at a scale of 1, then the actual plotted text size will be **0.12"**.

1B.   ENTERING TEXT IN PLAN OR PROFILE VIEW

Keep in mind when working with text in plan and profile view that the end product is the drawing in sheet view. Therefore, we'll define the text size we end up with in sheet view as the "Resulting Text Height". There are three variables that affect the Resulting Text Height in sheet view:

1.   The plot scale

2.   The dynaview scale used to import the view from plan or profile view to sheet view

3.   The text or label size entered for a specific command

The formula to calculate Resulting Text Height (RTH) is:

RTH = plot scale x (dynaview scale) $^{-1}$ x text height in plan or profile view

For example:

If: plot scale = 50
       dynaview scale = $(200)^{-1} = 0.005$
       text height entered with **T**ext command = 0.1

Then: RTH = 50 x 0.005 x 0.1 = 0.025" in sheet view, which would be too small.

1B-1.   <u>TABLE METHOD FOR TEXT SELECTION</u>

The following tables have been developed to let the user select what text or label size to use dependent on the three variables.

Selecting text size for use in plan or profile view for <u>8 ½" x 11"</u> or <u>11" x 17"</u> sheets:

"B" TABLES

To get 0.04" resultant text size in sheet view (contour labels) use the following text size in plan or profile view:

Table 11-B1

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.04	0.08	0.1	0.2	0.4	0.8
PLOT	25	0.016	0.032	0.04	0.08	0.16	0.32
SCALE	50	0.008	0.016	0.02	0.04	0.08	0.16
	100	0.004	0.008	0.01	0.02	0.04	0.08
	200	0.002	0.004	0.005	0.01	0.02	0.04

To get 0.06" resultant text size in sheet view (notes and dimensions) use the following text size in plan or profile view:

Table 11-B2

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.06	0.12	0.15	0.3	0.6	1.2
PLOT	25	0.024	0.048	0.06	0.12	0.24	0.48
SCALE	50	0.012	0.024	0.03	0.06	0.12	0.24
	100	0.006	0.012	0.015	0.03	0.06	0.12
	200	0.003	0.006	0.0075	0.015	0.03	0.06

To get 0.09" resultant text size in sheet view (grid labels and titles) use the following text size in plan or profile view:

Table 11-B3

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.09	0.18	0.225	0.45	0.9	1.8
PLOT	25	0.036	0.072	0.09	0.18	0.36	0.72
SCALE	50	0.018	0.036	0.045	0.09	0.18	0.36
	100	0.009	0.018	0.0225	0.045	0.09	0.18
	200	0.0045	0.009	0.01125	0.0225	0.045	0.09

Selecting text size for use in plan or profile view for 22" x 34" sheets:

"D" TABLES

To get 0.08" resultant text size in sheet view (contour labels) use the following text size in plan or profile view:

Table 11-D1

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.08	0.16	0.2	0.4	0.8	1.6
PLOT	25	0.032	0.064	0.08	0.16	0.32	0.64
SCALE	50	0.016	0.032	0.04	0.08	0.16	0.32
	100	0.008	0.016	0.02	0.04	0.08	0.16
	200	0.004	0.008	0.01	0.02	0.04	0.08

To get 0.12" resultant text size in sheet view (notes and dimensions) use the following text size in plan or profile view:

Table 11-D2

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.12	0.24	0.3	0.6	1.2	2.4
PLOT	25	0.048	0.096	0.12	0.24	0.48	0.96
SCALE	50	0.024	0.048	0.06	0.12	0.24	0.48
	100	0.012	0.024	0.03	0.06	0.12	0.24
	200	0.006	0.012	0.015	0.03	0.06	0.12

To get 0.18" resultant text size in sheet view (grid labels and titles) use the following text size in plan or profile view:

Table 11-D3

DYNAVIEW SCALE

		10	20	25	50	100	200
	10	0.18	0.36	0.45	0.9	1.8	3.6
PLOT	25	0.072	0.144	0.18	0.36	0.72	1.44
SCALE	50	0.036	0.072	0.09	0.18	0.36	0.72
	100	0.018	0.036	0.045	0.09	0.18	0.36
	200	0.009	0.018	0.0225	0.045	0.09	0.18

To use the tables:

1.	Determine what sheet size is desired, <u>22" x 34"</u> or <u>11" x 17"</u>.

2.	Determine if the text is general text notes, contour labels, or titles, and then find the appropriate table for the recommended resulting text size.

3.	Determine what dynaview scale will be required to have the plan or profile view fit properly on the sheet.

4.	Determine what the plot scale is set to.

5.	Enter the appropriate table at the selected plot scale and of dynaview scale and find the text size to use.

Example problem:

Label the contours in plan view and the grid in profile view. The profile of the structure centerline has been profiled and a grid added, and a D-size sheet with the dynaviews has been started in sheet view.

1.	Load the existing project file Tmnote11.pro

2.	In plan view:

	a.	Check that the current plot scale is set to 25.

	b.	Decide that we want to place the dynaview box that is around the structure area on an D-size sheet in sheet view, choose a dynaview scale to use of 50.

	c.	Use Table 11-D1 for selecting text height for contour labels. Enter the table with the plot scale of 25 and the dynaview scale of 50 and pick the text size of **0.16"** to use for contour labels. This will result in 0.08" labels in sheet view.

	d.	Contour the POINTS layer, using the Settings button to change the tmodelf text height to **0.16"**

	e.	Turn visibility off of the POINTS layer.

	f.	Use the dynaview command to put the drawing in sheet view using dynaview scale of 50.

3.	Change to profile view:

	a.	We want to place the dynaview box surrounding the profile on the D-size sheet in sheet view, choose a dynaview scale of 25 and a plot scale of 50 (check this in View Settings).

	b.	Use Table 11-D3 for selecting a grid label height, dynaview scale 25 and

plot scale 50 results in text size of **0.09"**. This will result in 0.18" labels in sheet view.

c.   Use the label grid command using the Settings button to select a tmodelf font label height of **0.09"** for horizontal and vertical axes.

d.   Use the dynaview command to put the drawing in sheet view using dynaview scale of 25.
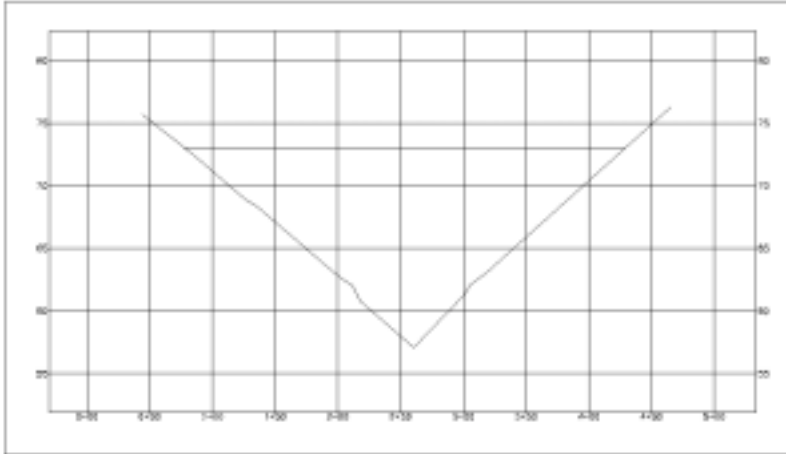
4.   In sheet view:

To check the resulting text height of the grid labels and contour labels, window in around the text and use the **D**istance command to visually check the height from top of text to bottom of text. Note that since these are dynaviews, the text itself can not be selected.
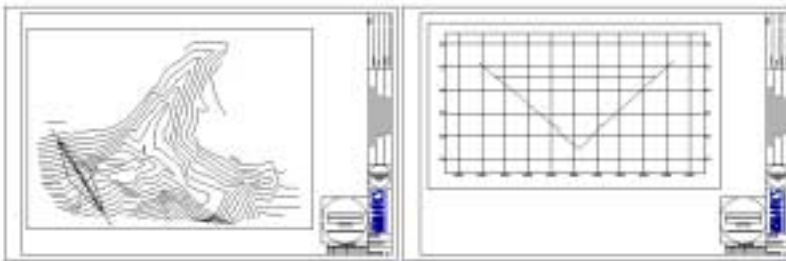
1B-2. <u>CHANGING PLOT SCALE METHOD FOR TEXT SELECTION</u> –

<u>PREFERRED METHOD!!!</u>

If you look at the tables, note that when the dynaview scale is equal to the plot scale, the selected text size is equal to the desired resulting text height.

> For example, look at Table 11-B2 for resultant text height of 0.06" if the plot scale of 50 is entered with the dynaview scale of 50, the text size selected is also 0.06".

Therefore, rather than enter the tables to figure out what text size to use in each situation, another option is to:

1.   Determine the desired resulting text height.

2.   Determine what dynaview scale will be used to import the view to sheet view.

3.   Change the plot scale to equal the dynaview scale.

4.   Use the same text size for text and label commands as the desired resultant text height.

For example:

> If: Desired resulting text height is 0.18" (titles)
> and the dynaview scale to be used = 10

> Then: Change the plot scale to 10
> and use 0.18 for the **T**ext commands.

Caution: Once the **T**ext command has been executed, changing the plot scale does not change the resulting text height in sheet view. Therefore, method 1B-2 shown above can not be used to edit existing text size.

To prove this point:

1.   Check the height of the contour labels in sheet view with the **D**istance command: 0.08".

2.   Change the plot scale for plan view from 25 to 100 (this can be done in sheet view with View Settings, change the view to Plan.

3.   Now, check the height of the same text again in sheet view with **D**istance command and note that it has not changed. Switch to plan view and check the text height there. It should now be 0.04", it was 0.16".

With a constant dynaview scale and the text height changing proportionate to the changing plot scale, the resulting text height is unaffected by changing the plot scale after text has been entered. See the next section on editing text to change text height.

2.   EDITING TEXT

The **ED**it object command is used for editing text. The contents of the text can be changed along with how the text looks.

For example, to edit the line of text "Centerline of Structuree"

Centerline of Structuree
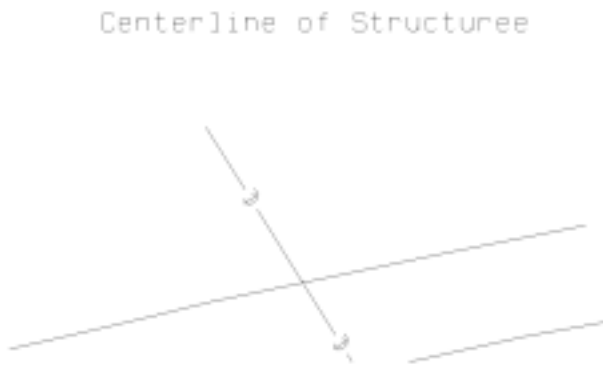
      [Edit] – [**ED**it object]
      Obj: **[ ]** Select the text
      Arrow over or place your cursor on one of the extra e's and delete it
      [OK]

There are other ways to edit text, including height, slant, justification, and orientation.

For example, if we have found after reading Section 1 of this TMNote that we have used the wrong text size for our note in Plan View:

First, change the plot scale to 50, since the dynaview scale is 50.

Then, change the text height:

(We are still in the **ED**it command)
      [Edit]
      [Metrics]
      Height: **0.12**
      [OK]
      [OK]
      [Close]

3.   ADDING ADDITIONAL CONTOUR LABELS

Sometimes it would be beneficial to have more contours labeled. This becomes more evident when dynaviews are used to import only a portion of the survey into sheet view where there may not be many index contours. Make sure your text size is set correctly in the Contour Settings before executing this command.
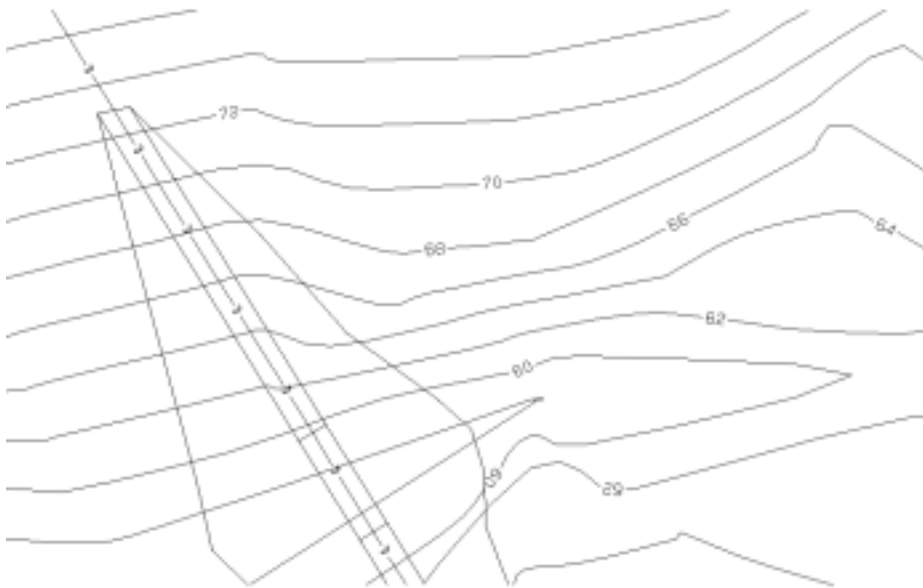
To add additional contour labels:

> [Draft] – [Label contours]
> Mode: **Pick**
> Contour: **[ ]** Select contour lines at locations where you want a label.
> **[Close]**

Note: The contour settings contain several other ways of changing the labeling, such as "Label ends of open contours", changing the "Dist. between labels" or reducing the index contour interval with "Label nth contour".

4.   <u>CHANGING LINETYPE SCALES</u>

Linetypes are dependent on the plot scale and dynaview scale in a similar way that text is, as described in section 1 of this TMNote.

For example, check that the plot scale is set to 50, and look at the sheet view which had a dynaview imported at a scale of 100. Notice how the centerline interval spacing looks.

Now, change the plot scale for plan view to 200, **R**edraw, and see the difference.

The desired linetype scale results when the dynaview scale = the plot scale.

If a dynaview scale of 50 will be used, change the plot scale back to 50.

A problem with this approach occurs when multiple dynaviews are to be placed on the sheet that require different dynaview scales. Changing the plot scale will affect each dynaview and the scales of its linetypes.

The **BLO**ck command is useful in freezing a group of objects such as a profile, however the linetype scale of the block will be affected by changing the plot scale.

An approach that will work is to use the **REVIEW** command on one profile prior to changing the plot scale for another dynaview.

See note 19 for more instruction on the **REVIEW** command.

5.   CHANGING ARROWHEAD SIZES

Arrowhead sizes are also dependent on plot scale and the dynaview scale.

Arrowheads that are created in sheet view, such as with the **SLL** command, are approximately 0.2" long. Therefore one approach to achieve consistent size of arrowheads is to create them in sheet view.

If the plot scale is set at 50 and a dynaview scale of 10 is used the arrows will end up 0.2 x 50 x 0.1 = 1" long in sheet view, as shown on the next page by the arrow shown to the centerline of the structure.

Therefore, as noted for text and for linetypes, it is desirable to set the plot scale to equal the dynaview scale. When this is done, the arrowheads imported into sheet view will be the same size as those drawn in sheet view. But, the same problem arises as for linetypes in that changing the plot scale to work on a different profile or plan detail will change the existing arrowheads in sheet view.

Therefore, it is recommended to **REVIEW** a profile or plan view before changing plot scale to work on another detail.

6.   SUGGESTIONS ON PLOTTING DESIGN SURFACES

Design surfaces consist of many sets and points. Plotting each point is not necessary and actually makes the drawing appear more ragged.

Therefore it is desirable to change color of each point on the design surface to color number 1, which is assigned to pen 0, which means it will not plot. To do this:

        [Settings] – [Search settings…]
        Take off all checks except Points

        [Modify] – [**COL**or]
        Objs: (rt click) **Layer**
        [ ] Select any point from the design surface
        Color: **1**

Go back into Search settings and re-check all items.

Also change the color of any lines on the design surface that we do not want plotted to color number 1, such as the template lines.

Now the design surface can be plotted and the points and extra template lines will not be plotted which will result in a cleaner drawing.